

Sand dune flora of Western Rajasthan

1. Systematic list of trees, shrubs and herbs

BY

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INTRODUCTION

About 60% of the arid region of Western Rajasthan is sandy and a major portion of this is occupied by sand dunes. These dunes are found mostly in Bikaner, Churu, Barmer, Jaisalmer and Jodhpur districts, though scattered patches are also met in Pali, Jalore, Sirohi, Jhunjhunu and Sikar districts.

The pioneering work of Blatter & Hallberg (1918-1921) on the 'Flora of Indian Desert' mentioned several ecological formations. A biological spectrum was given by Das & Sarup (1951). Sankhala (1951) enumerated the list of plants under various life forms. Agharkar (1952), Sarup & Bhandari (1958) and Joshi (1958) dealt with some ecological aspects of Bikaner. In eastern Rajasthan, Nair & Joshi (1958) contributed to the sand dune ecology of Pilani and its neighbourhood. Recently Shankarnarayan *et al.* (1965) worked out the dune ecology of Osian, but very little study has been made in other regions. The present studies are aimed at making a preliminary record of the flora of some of these sand dunes, based on the plants collected during our surveys.

PHYSICAL FEATURES

Dunes are mainly of three types, longitudinal, transverse and parabolic. While the longitudinal dunes are parallel to the direction of the prevailing winds, transverse dunes are formed on account of obstruction in the path of prevailing winds. The old system consists of dunes of high relief, while those of new system are still in the evolutionary stage and are called embryonic dunes. The windward slope of these dunes is very gentle and quite often cut by short streams, and subjected to wind scouring, while the leeward side is mostly steep.

CLIMATE

Low, erratic, annual rainfall, seasonal and diurnal fluctuations of temperature and intense solar radiation are characteristic climatic

features of sand dune ecosystem. Scorching heat with dust storms during the summer months and biting cold with dew, mist, and fog during winter months modify the vegetation to a great extent.

The rainfall occurs mainly during July-September. The temperature conditions also vary like the rainfall. Maximum temperature is generally recorded during May when hot winds, *Loo*, blow but the nights are almost always pleasant. Minimum temperature in Bikaner and Jaisalmer districts goes down in winter to freezing and even below freezing point, resulting in heavy frost or dew formation on the dunes. Wind velocity is minimum during November (4.0-5.8 km./hr.) but goes on increasing up to June when it is maximum (12.0-31.0 km./hr.). Humidity is minimum during the period October to March and begins to rise from May onwards and is maximum during August.

VEGETATION

Plants are conservative in their selection of habitat, water requirements etc. and thus may be called indicators of habitats. Every keen naturalist has the experience as to how plants behave differently on various habitat types. Some plants select only the leeward side of the dune, while others may be present on the crest, and still others in the interdune areas and at the base of dunes.

Crests of sand dunes which are active, support plants like *Panicum antidotale*, *P. turgidum*, *Calligonum polygonoides*, *Tephrosia falciformis* and *Cyperus arenarius*. Sand dune tops, where small sand dunes are aggregated, species like *Cyperus arenarius* and *Aristida funiculata* are among the first arrivals and are followed by *Dipterygium glaucum*, *Tephrosia falciformis* and *Capparis decidua*.

On the slopes, the windward side has a better vegetation than the leeward side. Various plants like *Cenchrus* spp., *Aristida* spp., *Lasiurus sindicus*, *Crotalaria burhia*, *Tribulus terrestris*, *Enicostemma verticillatum*, *Arnebia hispidissima*, *Gisekia pharnacoides*, *Indigofera cordifolia*, *Calligonum polygonoides* occupy this region. The leeward side, due to the steep slopes sometimes followed by heavy runoff, supports only a few very hardy species, with least water requirement like *Aerva pseudotomentosa*, *Leptadenia pyrotechnica* etc. There is a profound difference in the composition and frequency of different species found on the two sides of the dunes.

Base of the dune and interdunal areas support luxuriant vegetation with good growth of plant species due to the accumulation of water from the surrounding areas. The common species encountered are *Tecomella undulata*, *Prosopis cineraria*, *Farsetia hamiltonii*, *Polygala eriopetera*, *Polycarpaea corymbosa* etc. *Mollugo cerviana*, *Cyperus arenarius*, *Aristida adscensionis*, *A. funiculata*, *Cenchrus biflorus* are some of the

pioneers, which are followed by species like *Cenchrus ciliaris*, *C. prieurii*, *C. pennisetiformis*, *Lasiurus indicus*, *Panicum antidotale*, *Panicum turgidum*, *Aerva persica*, *A. pseudo-tomentosa*, *Crotalaria burhia* and *Leptadenia pyrotechnica* which firmly hold the sand particles in the mesh of their root system.

LIST OF SPECIMENS COLLECTED

Plants enumerated in the list have been collected from sand dunes in W. Rajasthan and are preserved at the herbarium, Central Arid Zone Research Institute, Jodhpur. Nomenclature of plants is according to latest findings. Flowering season and life forms for each plant have been indicated.

CRUCIFERAE

***Dipterygium glaucum* Decaisne**

6-10 dm. tall, perennial, erect undershrub, with yellow flowers. Common on the windward side of dunes. Fls. Aug.-Nov. (Chamaephyte).

***Farsetia hamiltonii* Royle**

3-4 dm. tall, sub-erect, annual herb with pink to white flowers. Often seen at the base of dunes and the interdune areas. Fls. Aug.-Nov. (Therophyte).

CAPPARIDACEAE

***Capparis decidua* (Forsk.) Edgew.**

2-4 m. tall, deciduous, spiny shrub; when protected often attains tree-size. Flowers yellow. Common on the windward side and top of the dunes. Fls. Jan.-Aug. rare plants up to Oct. (Phanerophyte).

***Cleome gynandra* Linn.**

3-4 dm. tall, erect, annual herb with yellow flowers. Mostly found around the base of dunes and in interdune areas. Fls. Aug.-Dec. (Therophyte).

***Cleome viscosa* Linn.**

2-4 dm. tall, erect, annual herb with yellow flowers. Found mostly at the base of dunes and in the interdune areas. Fls. July-Nov. (Therophyte).

POLYGALACEAE

Polygala erioptera DC.

2-3 dm. tall, erect to sub-erect, annual herb with pinky-mauve or yellow flowers. Found on the base of the dunes and interdune area. Fls. Aug.-Nov. (Therophyte).

CARYOPHYLLACEAE

Polycarpaea corymbosa (L.) Lamk.

1.5-2.5 dm. long, erect, annual herb with white flowers having a pinkish tinge. Common on interdune areas and leeward side of the dunes. Fls. Aug.-Nov. (Therophyte).

MALVACEAE

Sida ovata Forsk.

5-6 dm. tall, erect, perennial undershrub with pale-yellow flowers. Frequent on the interdune areas. Fls. Aug.-Nov. (Chamaephyte).

STERCULIACEAE

Melhania denhamii R.Br.

About 1 m. tall, bushy perennial with yellow flowers. Frequent on hill-side dunes. Fls. Aug.-Dec. (Chamaephyte).

TILIACEAE

Corchorus depressus (Linn.) Christensen

1.5-2.0 dm. long, prostrate, perennial herb with yellow flowers. Frequent on interdune areas. Fls. Aug.-Nov. (Chamaephyte).

C. tridens Linn.

3-4 dm. tall, erect, annual herb with yellow flowers. Frequently on the windward side of dunes. Fls. Aug.-Nov. (Therophyte).

Grewia tenax (Forsk.) Fiori

1.0-1.5 m. tall shrub with yellow flowers. Frequent on hill-side dunes. Fls. July-Nov. (Nanophanerophyte).

ZYGOPHYLLACEAE

Fagonia cretica Linn.

1.5-2.0 dm. tall, spiny undershrub with pink flowers, rarely white. Common on interdune areas and hill-side dunes. Fls. July-Nov. (Therophyte).

***Tribulus alatus* Del.**

1-3 dm. long, sub-erect, prostrate, annual herb with yellow flowers. Common on the windward side of the dunes and also on the top of stabilized dunes. Fls. Aug.-Dec. (Therophyte).

***T. terrestris* Linn.**

2-4 dm. long, prostrate-suberect, annual herb with yellow flowers. Common on the windward sides and top of the stabilized dunes. Fls. Aug.-Dec. (Therophyte).

SIMAROUBACEAE

***Balanites aegyptiaca* (Linn.) Del.**

3-4 m. tall, thorny shrub with greenish-white flowers. Common on hill-side dunes. Fls. April-Sept. (Phanerophyte).

CELASTRACEAE

***Maytenus emarginata* (Willd.) Ding Hou**

3-4 m. tall, deciduous, thorny tree with white flowers. Common on the hill-side dunes and interdune areas. Fls. Oct.-March (Phanerophyte).

RHAMNACEAE

***Zizyphus nummularia* (Burm. f.) Wight & Arn.**

1-2 m. tall, bushy shrub, sometimes large like a tree with greenish white flowers. Common on hill-side dunes and interdune areas. Fls. Sept.-March (Nanophanerophyte).

FABACEAE

***Crotalaria burhia* Buch.-Ham. ex Benth.**

0.5-1.5 m. tall, erect, perennial shrub with yellow flowers. Common on the leeward and windward sides and on interdune areas. Fls. Oct.-March (Chamaephyte).

***Indigofera caerulea* Roxb.**

4-6 dm. tall, erect, perennial shrub with pinkish flowers. Frequent on the interdune areas. Fls. Aug.-Jan. (Chamaephyte).

***I. cordifolia* Heyne ex Roth.**

15-25 cm. long, prostrate to sub-erect, annual herb with bright red flowers. Common on interdune areas and the windward slopes of dunes. Fls. Aug.-Dec. (Therophyte).

I. hochstetteri Baker

3-4 dm. long, sub-erect, annual herb with pink flowers. Common on interdune areas. Fls. Aug.-Dec. (Therophyte).

I. linifolia (L.f.) Retz.

2-3 dm. long, prostrate, annual herb with bright red flowers. Common on the hill-side dunes and frequent on the windward slopes and interdune areas. Fls. Aug.-Dec. (Therophyte).

I. linnaei Ali

1.0-3.0 cm. long, prostrate-suberect, annual herbs with pink red flowers ; frequent on windward side of stable sand dunes, interdune areas. Fls. Jan.-March (Therophyte).

Phaseolus trilobus (L.) Ait.

3-6 dm. long, erect-climbing, annual herb with yellow flowers. Frequent on the windward side of dunes and also on cultivated dunes. Fls. Aug.-Nov. (Therophyte).

P. aconitifolius Jacq.

3-6 dm. long, suberect-climbing, annual herb with yellow flowers. Frequent on cultivated dune slopes. Fls. Aug.-Nov. (Therophyte).

Tephrosia falciformis Ramaswamy

6-9 dm. tall, erect, perennial herb with pinkish violet or rosy flowers. Common on top of sand dunes, and on the windward and leeward sides. Fls. Aug.-Nov. (Hemicryptophyte).

T. purpurea (L.) Pers.

4-6 dm. tall, erect, perennial herb with pink-violet flowers. Common on the windward side and interdune areas. Fls. Aug.-Nov. (Hemicryptophyte).

T. villosa (Linn.) Pers.

4-6 dm. tall, erect, perennial undershrub with pinkish violet flowers. Frequent on the windward slope of the dunes. Fls. Aug.-Dec. (Hemicryptophyte).

MIMOSACEAE

Acacia jacquemontii Benth.

1.5-3 m. tall, bushy shrub with yellow flowers in globose heads. Frequent on the slopes of the dunes. Fls. Jan.-June (Phanerophyte).

A. nilotica (Linn.) Delile ssp. **indica** (Benth.) Brenan

3-5 m. tall, thorny tree with yellow flowers in terminal heads. Common in the interdune areas only, not on the dunes. Fls. Sept.-May (Phanerophyte).

A. senegal (L.) Willd.

3-6 m. tall, prickly tree with white flowers. Common on top of hill-side dunes. Fls. April-May (Phanerophyte).

Prosopis cineraria (Linn.) MacBride

3-6 m. tall, spiny tree with yellow flowers in spikes. Common on the top, slope and base of dunes and in interdune areas. Fls. Oct.-May (Phanerophyte).

P. juliflora (Sw.) DC.

2.5-4 m. tall, spiny tree with yellow flowers. Completely naturalised in the area, native of Mexico. On interdune areas especially. Fls. Oct.-May (Phanerophyte).

CUCURBITACEAE

Citrullus colocynthis (L.) Schrad.

1-2 m. long, annual, trailing herb with yellow flowers. Common on the windward slopes, interdune areas and sandy hummocks. Fls. Sept.-Dec. (Therophyte).

Cucumis myriocarpus Naud.

1-2 m. long, annual trailer or climber with yellow flowers. Common on the windward slopes and tops of dunes. Fls. Aug.-Oct. (Therophyte).

C. pseudo-colocynthis Royle

1-1.5 m. long, annual trailer or climbing herb with yellow flowers. Common on slopes and base of dunes. Fls. Aug.-Oct. (Therophyte).

Mukia maderaspatana (L.) M. Roem.

1-2 m. long, climbing, annual herb with yellow flowers. Frequent on shrubs and trees in the interdune areas and on the windward slopes. Fls. Aug.-Oct. (Therophyte).

MOLLUGINACEAE

Gisekia pharnaceoides Linn.

1.5-2.5 dm. tall, erect, annual, psammophytic herb with white flowers. Common on the windward slopes and interdune areas. Fls. Aug.-Nov. (Therophyte).

Mollugo cerviana (L.) Ser.

1-2 dm. tall, erect herb with greenish-white flowers. Common on tops of dunes and interdune areas. Fls. Aug.-Nov. (Therophyte).

M. nudicaulis Lamk.

2-3 dm. tall, erect, annual herb with white flowers. Frequent on the windward slopes and interdune areas. Fls. Aug.-Nov. (Therophyte).

Trianthema govindia Buch. Ham. ex DC.

3-4 dm. long, prostrate, annual herb with dark red flowers. Common on slopes and interdune areas. Fls. Aug.-Nov. (Therophyte).

RUBIACEAE

Borreria articularis (L.f.) F.N. Will.

2-3 dm. tall, erect to decumbent, annual herb with pinkish-white flowers. Common on interdune areas. Fls. Aug.-Nov. (Therophyte).

COMPOSITAE

Echinops echinatus Roxb.

3-5 dm. tall, erect, annual, spiny herb with white flowers. Frequent on interdune areas. Fls. Feb.-June (Therophyte).

Pulicaria angustifolia DC.

3-4 dm. tall, erect, annual herb with yellow flowers. Common on interdune areas and sandy hummocks. Fls. Aug.-Dec. (Therophyte).

P. wightiana (DC.) Benth. ex Clarke

4-8 dm. tall, sub-erect, woody, perennial herb with yellow flowers. Common on interdune areas. Fls. Aug.-Dec. (Chamaephyte).

SALVADORACEAE

Salvadora oleoides Decaisne

8-15 m. tall, evergreen tree with white flowers. Common on all types of dunes and interdune areas. Fls. Feb.-April (Phanerophyte).

ASCLEPIADACEAE

Calotropis procera (Ait.) R. Br.

1-1.5 m. tall, erect, perennial herb with violet flowers. Common on dunes and interdune areas. Fls. Sept.-Dec. (Chamaephyte).

Leptadenia pyrotechnica (Forsk.) Decaisne

1-2 m. tall, much branched, leafless, perennial bush with pale yellow flowers. Common on the windward side and top of the dunes and on the interdune areas. Fls. Aug.-Dec. (Nanophanerophyte).

GENTIANACEAE

Enicostemma hyssopifolium (Willd.) Verdoon

2-4 cm. tall, erect, decumbent, perennial herb with yellow flowers. Frequent on windward side of hill-side dunes. Fls. Aug.-Oct. (Hemicryptophytes).

BORAGINACEAE

Arnebia hispidissima (Lehm.) DC.

2-3 dm. tall, erect, strigose, perennial undershrub with yellow flowers. Frequent on all types of dunes. Fls. Oct.-Jan. (Cryptophyte).

Sericostemma pauciflorum Stocks

2-3 dm. tall, erect, perennial undershrub with white flowers. Common on hill-side dunes. Fls. Oct.-Jan. (Chamaephyte).

CONVOLVULACEAE

Convolvulus microphyllus Sieb. ex Spreng.

3-4 dm. tall, sub-erect or climbing, annual herb with pinkish white flowers. Sometimes on interdune areas. Fls. Aug.-Nov. (Therophyte).

Evolvulus alsinoides (L.) L.

1.5-2.0 dm. long, prostrate, annual herb with blue-purple flowers. Frequent on dune slopes. Fls. Aug.-Dec. (Therophyte).

Ipomoea sindica Stapf.

4-8 dm. tall, climbing, annual herb with white flowers. On cultivated dunes. Fls. Aug.-Oct. (Therophyte).

I. pes-tigridis Linn.

1-1.5 m. long, twining or spreading, annual, hispid herb with white or pinkish white flowers. Frequent on hedges in interdune areas. Fls. Sept.-Oct. (Therophyte).

SOLANACEAE

Lycium barbarum Linn.

1-2 m. tall, spiny, perennial shrub with white flowers. Common on all types of dunes and on interdune areas. Fls. Oct.-March (Phanerophyte).

***Solanum surattense* Burm. f.**

3-4 dm. tall, erect, much branched, perennial under-shrub with pinkish purple flowers. Frequent on dune slopes and interdune areas. Fls. June-March (Chamaephyte).

OROBANCHACEAE

***Cistanche tubulosa* Wight**

3-5 dm. tall, erect perennial herb with pinkish-violet flowers. Root parasite on *Salvadora*. Fls. Nov. (Cryptophyte).

BIGNONIACEAE

***Tecomella undulata* (Sm.) Seem.**

2-3 m. tall, deciduous tree with yellow or orange red flowers. Common on interdune areas. Fls. Jan.-March (Phanerophyte).

PEDALIACEAE

***Pedaliium murex* Linn.**

1.5-4 dm. tall, erect, much branched annual with yellow flowers. Frequent on dune slopes and interdune areas. Fls. Aug.-Oct. (Therophyte).

ACANTHACEAE

***Blepharis linearifolia* Pers.**

1.5-3 dm. long, sub-erect, perennial herb with violet-blue flowers. Frequent on hill-side dunes. Fls. Aug.-Sept. (Cryptophyte).

VERBENACEAE

***Clerodendrum multiflorum* (Burm. f.) Retz.**

1-2 m. tall, perennial shrub with white flowers. Frequent on dune slopes and often used in hedges. Fls. Aug.-Nov. (Nanophanerophyte).

LABIATAE

***Leucas cephalotes* (Roth.) Spreng.**

3-6 dm. tall, erect annual with white flowers. Common on interdune areas and near fields. Fls. Aug.-Oct. (Therophyte).

NYCTAGINACEAE

Boerhavia diffusa Linn.

6-10 dm. long, trailing, prostrate, perennial herb with pink flowers. Frequent in interdune areas. Fls. Major part of the year (Hemicryptophyte).

AMARANTHACEAE

Aerva persica (Burm. f.) Merr.

5-10 dm. tall, erect, perennial herb with greenish white flowers. Common on leeward and windward sides of dunes, also on interdune areas. Fls. Aug.-Dec. (Hemicryptophyte).

A. pseudo-tomentosa Blatt. & Hall.

8-15 dm. tall, erect perennial with greenish white flowers. Common on the windward and leeward sides of dunes. Fls. Aug.-Dec. (Hemicryptophyte).

Digera alternifolia (L.) Aschers.

3-4 dm. tall, erect, annual herb with pink or rosy flowers. Frequent in interdune areas. Fls. April-Dec. (Therophyte).

Pupalia lappacea (L.) A. Juss.

1-1.5 m. tall, straggling, perennial herb with pale green flowers. Frequent in interdune areas. Fls. Aug.-March (Hemicryptophyte).

POLYGONACEAE

Calligonum polygonoides Linn.

1.5-2.0 m. tall perennial, leafless shrub with pink flowers. Common on dune tops and interdune areas. Fls. Feb.-June (Nanophanerophyte).

EUPHORBIACEAE

Euphorbia clarkeana Hook. f.

1-2 dm. long, sub-erect, annual herb with greenish white flowers. Frequent in the interdune areas. Fls. Aug.-Sept. (Therophyte).

E. granulata Forsk.

1.0-1.5 dm. long, prostrate, annual herb with pink flowers. Frequent on stabilised dunes. Fl. and Fr. Oct.-Feb. (Therophyte).

CYPERACEAE

Cyperus arenarius Retz.

1-2 dm. tall, erect, perennial sedge. Common on the top of sand dunes and sandy hummocks. Fls. Aug.-Dec. (Cryptophyte).

C. bulbosus Vahl.

2-3 dm. tall, erect, rhizomatous sedge ; spikes brown-red. Frequent in the interdune areas. Fls. Aug.-Dec. (Hemicryptophyte).

C. conglomeratus Rottb.

2-3 dm. tall, erect, perennial, rhizomatous sedge. Spikelets white. Common on windward slopes and interdune areas. Fls. Aug.-Dec. (Hemicryptophyte).

C. rotundus Linn.

2-4 dm. tall, erect, perennial, rhizomatous sedge with dark-red spikelets. Frequent on interdune areas and base of dunes. Fls. Aug.-Dec. (Hemicryptophyte).

POACEAE

Aristida adscensionis Linn.

3-5 dm. tall, erect, annual grass. Common on the windward and leeward slopes and interdune areas. Fls. Sept.-Jan. (Therophyte).

A. funiculata Trin. et Rupr.

3-6 dm. tall, erect annual. Common on the dune slopes and interdune areas. Fls. Sept.-Jan. (Therophyte).

A. hirtigluma Steud. ex Trin. et Rupr.

3-5 dm. tall, erect, annual. Common on dune slopes and interdune areas. Fls. Sept.-Dec. (Therophyte).

A. pogonoptila (Jaub. et Spach.) Boiss.

3-6 dm. erect, tufted perennial. Common on the slopes and top of dune. Fls. Sept.-Feb. (Hemicryptophyte).

Cenchrus biflorus Roxb.

1-3 dm. tall, sub-erect, annual grass. Common on loose sands and hummocks and dune tops. Fl. Aug.-Jan. (Therophyte).

C. ciliaris Linn.

1-3 dm. tall, sub-erect, biennial or perennial grass. Common on dune slopes and in interdune areas. Fls. Aug.-Jan. (Hemicryptophyte).

C. pennisetiformis Hochst. ex Steud.

4-6 dm. tall, erect, perennial, tussocky grass. Common on dune slopes of mobile sand dunes. Fls. Sept.-Feb. (Hemicryptophyte).

C. prieurii (Kunth) Maire

2·5-4·5 dm. tall, sub-erect, annual grass. Common on dune slopes and on interdune areas. Fls. Sept.-Feb. (Therophyte).

C. setigerus Vahl

2-4 dm. tall, erect, perennial grass. Common on dune slopes and on interdune areas. Fls. Aug.-Jan. (Hemicryptophyte).

Cymbopogon jwarancusa (Jones) Schult.

6-10 dm. tall, erect, perennial, tussocky grass. Common on dune slopes and on interdune areas. Fls. Aug.-Nov. (Chamaephyte).

Dactyloctenium aegyptium (L.) P. Beauv.

3-5 dm. erect, stoloniferous, perennial grass. Common on dune base and stabilized sand dunes. Fls. Aug.-Feb. (Therophyte).

Eragrostis ciliaris (L.) R. Br.

1·5-2·5 dm. tall, erect grass. Frequent on interdune areas. Fls. Aug.-Dec. (Therophyte).

E. tenella (L.) P. Beauv.

3-4 dm. tall, erect, annual grass. Frequent in the interdune areas. Fls. Aug.-Nov. (Therophyte).

E. tremula Hochst. ex Steud.

3-4 dm. tall, erect, annual grass. Frequent in interdune areas and on sandy hummocks. Fls. Aug.-Nov. (Therophyte).

Lasiurus ecaudatus Saty. et Shank.

6-10 dm. tall, erect, perennial, tussocky grass. Common on dune slopes and interdune areas. A good sand binder. Fls. Aug.-Dec. (Therophyte).

Panicum antidotale Retz.

1-1·5 m. tall, erect, perennial grass. Very common on the crest and leeward slope of the dune. A good sand binder. Fls. Aug.-Dec. (Chamaephyte).

P. turgidum Forsk.

1-1·5 m. tall, erect, perennial, tussocky grass. Common on the top and dune slopes. Fls. Aug.-Nov. (Chamaephyte).

Perotis hordeiformis Nees apud Hook. et Arn.

2-4 dm. tall, erect, annual grass. Common on the interdune areas. Fls. Aug.-Dec. (Therophyte).

STATISTICAL SYNOPSIS OF SAND DUNE FLORA

Out of 58 families, 226 genera and 440 species recorded as indigenous in Western Rajasthan, 35 families covering 62 genera and 93 species are available from sand dunes of the area. Of these the families having two or more genera are : Cruciferae (2), Capparidaceae (2), Tiliaceae (2), Zygophyllaceae (2), Papilionaceae (4), Mimosaceae (2), Asclepiadaceae (2), Convolvulaceae (3), Solanaceae (2), Amaranthaceae (2) and Gramineae (8), while only the following families are represented by four or more species : Papilionaceae (11), Mimosaceae (5), Cucurbitaceae (4), Ficoideae (4), Convolvulaceae (4), Amaranthaceae (4), Cyperaceae (4) and Gramineae (17). The maximum number of genera and species are that of Gramineae (8 and 17) in this land-form. Family Compositae with 33 species, which comes next in rank to Gramineae in the flora of Western Rajasthan, lags behind in the dune flora and so also is the case with Cyperaceae.

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